Theory

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UK Online Community meeting on UK Particle Physics Roadmap

4 Feb 2026

Based on input sought at short notice from all UK particle theory groups

UK particle theory community & CG funding

University groups	2011	2013	2016	2019[1]	flat cash 2022[2]	with uplift 2022	2025
Number of proposals	18	17	18	18	20	20	
Consortium proposals	4	5	6	5	5	5	
Number of groups with zero funding	-	0	0	3	3	3	
Budget	£14.6M	£15.2M	£15M	£20M	£18M		
Number of academics bidding for non-zero academic time	163	176	186	222	243	243	
Number of academics funded	146	161	134	153	164	164	
Maximum academic time awarded	20%	20%	20%	8%	4%	4%	
Average academic time award (among non-zero awards)	14%	16%	13%	8%	4%	4%	
Number of PDRAs per year (FTE)	29.3	28	32	43	41.33	51.33	?
Ratio of PDRAs per bidding academic	0.18	0.16	0.17	0.19	0.17	0.21	
Ratio of PDRAs per funded academic	-	0.17	0.23	0.28	0.25	0.31	
Number of bidding academics per RA	5.6	6.3	5.8	5.2	5.8	4.7	

1) From CG2019 the figure includes the core and research programme of the IPPP
2) From CG2022 the figure excludes the core programme of the IPPP

Areas of research:

- Cosmology
- Lattice
- Phenomenology
- QFT
- Strings

STFC also funds IPPP(Durham) core programme directly

“70% of baseline” – look at example of postdoc FTE/year

					flat cash	with uplift
	2011	**2013**	**2016**	**2019[1]**	**2022[2]**	**2022**
postdoc FTE/year	29.3	28	32	43	41.33	51.33

1) From CG2019 the figure includes the core and research programme of the IPPP
2) From CG2022 the figure excludes the core programme of the IPPP

“Baseline” is probably not 2022, but more like the 2011-2016 level.

Past growth in number of postdocs achieved partly reducing FTE time (this has now hits its limit) and partly reflects change in counting (IPPP was separate in earlier years)

Example input from UK theory groups

“We are barely sustainable as it stands [...] one PDRA between several staff [...] Even a 20% cut would fully swallow up our entire travel and computing budget”

“potential for deeper and longer term destruction within the broad field of fundamental physics [...] Proposed STFC cuts come at a time of considerable financial distress in the UK HE sector and [my department] in particular is not immune to it”

“There is a lot of anger and fear here in [...]”

IPPP - Impact of Cuts

- HEPdata is a crucial database for HEP and beyond
  - Underpins much of the HEP experimental dissemination strategy
  - Crucial for reproducibility and interpretability of data
  - Cuts would undermine all of these efforts
- Reduced IPPP workshop support would hamper both theory & experimental collaboration/community building
- Reduced number of DIVA, Senior-Exp fellowships & IPPP associateships would reduce national & international knowledge exchange, & UK's international standing/visibility
- Reduced ECR training (YETI & YTF) negatively affects new generation
- Reducing National Centre Grant (QCD tools, flavour, neutrinos) impedes support for experiments

Summary of recurrent points

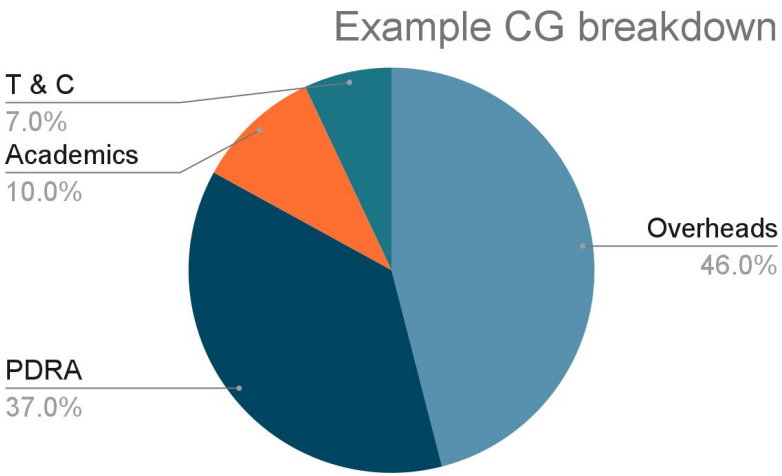
- 20% cut is very damaging, anything more is existential
- PDRAs: we've missed internationally agreed deadline for 2026 (Jan 30)
  - Only ~4 groups next year will have STFC-funded PDRAs (through no-cost extensions)
  - Whole generation of bright PhD students & postdocs whose UK career path has been interrupted and will be lost to the field
- Impact at faculty level:
  - Several groups fear redundancies if particle theory not seen to be supported
  - Other groups: substantial likely impact on future faculty hires
- Impact on international competitiveness
  - Reputational damage
  - Lack of travel funding for visibility
  - Lack of essential computing funding
  - With fewer postdocs, challenge of generating high-profile research that then attracts REF funding and prestigious international grants from ERC, Simons Foundation, etc.
  - Impact on interpretation of data from international experiments, exploitation of computing investments, etc.
- Impact on wider UK
  - cutting a relatively low-cost, high-prestige area runs directly against stated goals on STEM skills, regional research capacity, etc.

backup

Consolidated Grant

UK theory groups receive CG funding which mainly covers:

- Travel budget ~ £1.5k/year per staff
- Consumables ~ £500/year per staff
- Computing & admin support ~ 1 FTE/30 staff per CG
- PDRA hires ~ 0.2 FTE per staff (PP Strategic Review 2022)
- 0.04 FTE staff salaries



UK Particle Theory community

200+ particle physics theory academics across ~ 20 institutes

Theory underpins experimental research

- Predictions & data interpretation
- Guiding future experiments & discovery
- Good value for money: mostly person power
- Theory is “scalable” : reduced input = reduced outputs
- Loss of specialist expertise may be irreversible

Trains highly skilled individuals, boosting workforce & economy

- Next generation of leading academics, enabling UK universities to continue to shine
- AI, Defense, Space, Medical, Energy, Education, Policy, Gaming & Finance,...

STFC funds theory in four main streams:

Consolidated Grant (CG), PhD funding, IPPP (national centre) & Ernest Rutherford Fellowship (ERF)

General points from discussing with colleagues

- UK universities provide PP th 200+ academics that work on STFC remit
- Standing of particle physics community reflected by Universities willingness to support PP TH groups
  - Benefits: Great lecturers, good for UG recruitment, good for outreach
  - Also benefit from CG overheads & small amount of academic time
- Cuts will affect the bottom line for universities
  - motivation to support groups partly driven by CG overheads
- PP theory is relatively ‘scalable’: reduced funding = reduced output & impact
- Perhaps we can live with a 20% cut by travelling, hiring & producing less
- At some point there will be a cliff edge: universities may turn around and tell us it is not worth supporting our groups e.g. 60% cut

Consolidated Grant - Impact of Cuts

- Each group **will cut** travel, admin & computing support, & PDRA time
- CG delay: **no STFC-funded PDRAs advertised this year**
- Reduced PDRA funding
  - 0.2 FTE PDRA per staff is **already low** by international standards & will be reduced further
  - May remove geographically constrained early career researchers from the field
- Reducing all three aspects of spending will results in:
  - Significant loss of outputs affects ability to secure non-STFC funding
  - Reduced support for the experiments
  - Adverse effect on international visibility & competitiveness
  - Loss of expertise
  - Reduced university overhead may disincentive future investment in particle theory

short, medium, long term

- Future cuts in STFC-funded PhD studentships?

Ernest Rutherford Fellowships

- Important hiring route for theorists
  - Attracts internationally competitive scientists to the UK
- Historically 10 ERFs per year with ~ approximately ~1.5 particle theorists per year
  - Annual budget ~ £6 million
  - Last year only 7 were awarded (2 theorists)

- As of 2024, there are 48 ERF with 8 theorists

Reduced ERF funding will lead to shrinking of the field and loss of international competitivity